

**Translation**

**PATENT COOPERATION TREATY**

PCT/DE2003/001205



**PCT**

**INTERNATIONAL PRELIMINARY EXAMINATION REPORT**

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference In1228WO	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/DE2003/001205	International filing date ( <i>day/month/year</i> ) 10 April 2003 (10.04.2003)	Priority date ( <i>day/month/year</i> ) 22 April 2002 (22.04.2002)
International Patent Classification (IPC) or national classification and IPC H01L 21/768		
Applicant INFINEON TECHNOLOGIES AG		

<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>4</u> sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of <u>3</u> sheets.</p>
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the report</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>

Date of submission of the demand 24 October 2003 (24.10.2003)	Date of completion of this report 16 June 2004 (16.06.2004)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/DE2003/001205

## I. Basis of the report

### 1. With regard to the elements of the international application:\*

- ☐ the international application as originally filed
- ☒ the description:  
 pages \_\_\_\_\_ 1-12 \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☒ the claims:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, as amended (together with any statement under Article 19  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_ 1-11 \_\_\_\_\_, filed with the letter of \_\_\_\_\_ 03 June 2004 (03.06.2004)
- ☒ the drawings:  
 pages \_\_\_\_\_ 1/3-3/3 \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the sequence listing part of the description:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

### 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

### 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

### 4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/fig \_\_\_\_\_

### 5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/DE 03/01205

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)	Claims	2-6, 8, 9, 11	YES
	Claims	1, 7, 10	NO
Inventive step (IS)	Claims		YES
	Claims	1-11	NO
Industrial applicability (IA)	Claims	1-11	YES
	Claims		NO

**2. Citations and explanations**

1. Claim 1 includes the feature: the locally restricted heated area is moved in the finely structured metal-containing conducting track, and therefore the heated area is smaller than the conducting track. This is not originally disclosed and is therefore disregarded.

Document D1: US-A-5 405 804 shows the features of claim 1: see, in figure 5 and the related text, the finely structured metal-containing conducting track 4' ("fine" is undefined; for "structured", see column 3, lines 49 to 51) having a first particle size on a carrier material 1' to 3', and the production and movement (implicit in the small extent of a laser beam of, for example, 1 x 1 mm<sup>2</sup>; see column 6, line 35) of a locally restricted heated area in the conducting track 4' in such a way that recrystallization (see column 4, lines 27 and 28) is carried out in order to produce an enlarged, second particle size (purpose of the recrystallization; see column 1, lines 63 to 66).

2. Since conducting tracks are becoming increasingly smaller in order to improve the degree of integration, the subject matter of claim 2 is obvious.

D1 shows in figure 6A a conducting track 15 having a primary direction and a secondary direction perpendicular thereto. Since the area irradiated by the laser measures only 1 mm<sup>2</sup> to 1 cm<sup>2</sup> (column 6, lines 34 to 36), the heated area must be moved. This can occur in the following way: The laser beams 17 shown over the whole width of figure 8 imply a movement in the projection plane, that is, in the primary direction of conducting track 15. Then the adjacent area is heated, which requires movement of the heated area in the secondary direction. This suggests the features of claim 3.

As regards claim 4, heating can naturally be repeated a sufficient number of times until the maximum attainable particle size is attained.

D1 mentions, in the sentence linking columns 4 and 5, a lens by means of which the irradiated area can be extended. The subject matter of claims 5 and 6 is therefore routine practice.

The subject matter of claim 7 is known (see D1, column 1, lines 61 to 63).

For claims 8 to 11, attention is drawn to document D2: US-B1-6 242 808, which describes heat treatment at 400 °C (concerns claim 10; see also D1, column 6, line 57) for recrystallization of a structure produced using the Damascene process (see figures 1, 2 and 4; concerns claim 9) and comprising a barrier layer 12 and a seed layer 13 (concerns claim 8) in an inert gas atmosphere (see column 4, fourth paragraph; concerns claim 11).

Consequently, none of the claims complies with the requirements of PCT Article 33(2) and (3).